BLM LIBRARY
88078087

United States Department of the Interior
Bureau of Land Management

Fish & Wildlife 2000

Moving Toward Ecosystem Management

ANNUAL REPORT OF ACCOMPLISHMENTS FY 1993

SK
361
.F574
1993
c.3

#134385 0546 ID: 88078087

SK
361
.F574
1993
c.3

MISSION STATEMENT

The BLM is responsible for the balanced management of public lands and resources so that they best serve the American people. Management is based upon the principles of multiple use and sustained yield, a combination of uses that takes into account the long-term needs of future generations for renewable and non-renewable resources. These resources include recreation, fish and wildlife, wilderness, rangeland, forest, minerals, watershed, natural, scenic, scientific, educational and cultural values.

BLM Library
Denver Federal Center
Bldg. 50, OC-521
P.O. Box 25047
Denver, CO 80225

TABLE OF CONTENTS

Ecosystem Management....5
  Information Needs and New Tools....5
  Existing Program Review and Reform....5
  Training for the Future....7
Fish and Wildlife 2000....9
Economics of Wildlife-Associated Recreation....9
  Public Outreach....10
    Environmental Education....10
    Watchable Wildlife....11
    Partnerships....12
  Human Resources....14
    Improving Staff Infrastructure....14
    Training....14
Wildlife Habitat Management....15
  Waterfowl and Wetlands....15
  Upland Game Birds....16
  Neotropical Migratory and other Nongame Birds....17
  Raptors....19
  Big Game....21
  Amphibians and Reptiles....22
  Bats....22
  Other Species....23
Fisheries Habitat Management....23
  Anadromous Fish Habitat....24
    Columbia Initiative....24
    Coastal Initiative....24
    Alaska Initiative....25
  Resident Fish Habitat....26
Special Status Species Habitat Management....27
  Special Status Plant Habitat....27
  Special Status Fish Habitat....29
    Bring Back The Natives....29
  Special Status Animals Habitat....30
  Desert Tortoise....31
  Black-footed Ferret....31
Budget and Staffing....32
  Budget....32
  Staffing....34
Appendix I. Agencies and organizations with which BLM has partnership agreements and operations....35

ECOSYSTEM MANAGEMENT

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."
— Albert Einstein

In 1987, *Fish and Wildlife 2000* was conceived and subtitled as "A Plan For The Future." As that future has unfolded, *Fish and Wildlife 2000* has consistently demonstrated that it is both sensitive and responsive to changing needs and opportunities in conserving fish, wildlife and plant resources on America's public lands. Now, as we move into the mid-1990s, new and exciting opportunities lie ahead, with the promise of carrying *Fish and Wildlife 2000* forward to even greater success.

New paradigms are shaping the future in which fish and wildlife habitat management will be conducted: Ecosystem Management, Biological Integrity, Landscape Analysis, Range Reform, Land Health, Adaptive Management, and Plans for Sustainable Economies and Sustainable Environments. Of these, Ecosystem Management (EM) will be the driving force. Though still evolving from concept to process, Ecosystem Management recognizes that fish, wildlife, water and plant resources are the fundamental renewable building blocks of ecosystems.

Sustainability and biodiversity conservation are companion watchwords with Ecosystem Management. Historically, exploitation of renewable natural resources has taken place well before the extent of those resources and their capability for being naturally replaced was known. As a result, some have been overused and can no longer sustain historic levels of use without disappearing. Other resources have often been affected indirectly, to the extent that the list of Threatened and Endangered plants and animals is growing rapidly. Through the application of Ecosystem Management, BLM will determine the point where exploitation of renewable resources violates biological integrity. We cannot move beyond that point.

Ecosystem Management is being supported through integration of *Fish and Wildlife 2000* strategies with emerging EM principles, and through the development of new tools and training for field professionals and managers. As BLM delves further into EM, we continue to nurture and expand the partnerships we have developed with "single-focus" constituent organizations, many of whom do not understand how their interests will be affected by EM. All have an interest in the BLM maintaining healthy and productive ecosystems to meet their needs.

INFORMATION NEEDS AND NEW TOOLS

For many natural resources there is simply insufficient information upon which to base management decisions, no matter how sophisticated the data processing may be. Ecosystem Management will require more complete inventory information and more hands-on expertise in the processing technologies being developed. Many of these needs have already been identified in individual BLM State and District *Fish and Wildlife 2000* plans and in annual BLM Fish and Wildlife Program Needs Assessments.

Ecosystem Management will necessitate changes in the way land use planning is performed. Managers will rely more on predictive modeling, using computers to manipulate inventory, satellite, demographic and other data in Geographic Information System management scenarios. New employee skills and training will be needed. Professional disciplines such as Systems Ecologists and Conservation Biologists will be required.

EXISTING PROGRAM REVIEW AND REFORM

Some steps toward Ecosystem Management are already being taken. These include President Clinton's Forest Conference in the Pacific Northwest, and BLM's internal Rangeland Reform 1994 and Riparian Initiative. Fish, wildlife, water and plant resources will clearly benefit from these efforts. Ultimately, the Nation will too.

FY93 highlights of Ecosystem Management

include:

- Thematic Mapper scenes from LANDSAT imagery have been acquired in four areas of Alaska covering 26 million acres. Six million acres have been processed and analyzed using remote sensing and image processing techniques developed in partnership with Ducks Unlimited (DU) for waterfowl habitat.
- A Gila Box Riparian National Conservation Area management plan has been prepared to guide management along 38 miles of riparian canyons in southeastern Arizona for the next 15 years. The plan includes provisions for cooperative agreements with upstream land owners in the watershed to help improve habitat over a broader area.
- The San Pedro National Conservation Area Habitat Management Plan provides for a coordinated Ecosystem Management approach to encompass public demand for recreation and other uses with protection and enhancement of riparian values.
- Susanville District, California, completed a multi-resource, multi-agency, digital area vegetation map for the East Lassen Project Area, which encompasses over 1 million acres ranging from desert playas to high mountain conifers.
- In response to a request by sponsor organizations of the Colorado Livestock/Big Game symposium for proposals to demonstrate the resolution of livestock/big game conflicts through cooperative management, the Owl Ridge Ecosystem Management Project was proposed by the BLM, the North Park HPP Committee and other land management agencies. The five-year study seeks to improve private land livestock management operations while improving big game habitat.
- BLM's Desert District and the Southern California Association of Governments are cooperating to develop a regional biodiversity plan, using GAP analysis to delineate resource occurrences and uses. When completed, the plan will contain an Open Space Element, identified as an essential need during the University of California at Riverside Biodiversity Symposium.
- The Blanca Wetlands Area in Colorado is being managed under Ecosystem Management goals and objectives that were redefined from the previous waterfowl production area focus to a broader emphasis on wetlands, recreation, watershed and species diversity.
- The Soldier Meadows Conservation Project was approved between BLM, The Nature Conservancy and the Soldier Meadows Ranch in Humboldt County, Nevada. BLM purchased habitat for the threatened Desert Dace and Lahontan Cutthroat Trout as well as other natural and historical features of the ranch. This project will enhance and protect riparian ecosystems and should contribute to delisting of both species.
- In 1993, Colorado BLM initiated the Gunnison Basin Ecological Site Inventory in cooperation with the U.S. Forest Service and the Gunnison Basin Habitat Partnership Program. This five-year interjurisdictional agreement is designed to cover the entire Gunnison Basin, with approximately 500,000 acres of public lands.
- In coordination with the Wisconsin Department of Natural Resources, the Milwaukee District Office initiated inventory of 47 small public islands for their wildlife and recreation values, as well as their value to the much larger area encompassed by the Milwaukee Riverway Plan.
- The Ruby Canyon Ecosystem Management Plan is under development in Colorado with the goal of designating the 120,000-acre area as a National Conservation area. This plan will improve management decisions regarding watershed protection, scenic beauty, wildlife habitat for Desert Bighorn Sheep and other species, livestock grazing, recreational activities and the Black Ridge Wilderness study Area.
- The Idaho Falls District is compiling bald eagle data from Wyoming, Montana, Idaho and Yellowstone and Grand Teton National

Parks, as part of the Greater Yellowstone Ecosystem (GYE) Bald Eagle Working Group, to track eagle population trends. The data are being used as a historical index to population trends in the GYE, with the goal of downlisting the eagle's endangered status.

- Ecosystems relations data for New Mexico's Rio Puerco Resource Area were automated to aid revision of the Upper Rio Puerco HMP and to support program coordination. One application uses data files to correlate neotropical migrant and cavity nesting bird data with fuelwood and timber harvest actions.
- In the Pacific Northwest, Resource Management Plans for western Oregon Districts were developed using Ecosystem Based Management. By applying sustainability criteria, a variety of scenarios was analyzed using Geographic Information Systems. These analyses were a significant factor in President Clinton's Forest Conference decision for management actions on public lands in the region.
- Oregon/Washington BLM is hosting the development of 'Health To The Salmon,' a nonprofit organization dedicated to the rehabilitation of watersheds on public and private lands throughout the Northwest. Among the partnership's objectives is the funding of watershed restoration projects to benefit both anadromous fish and the many people affected by their population levels — virtually everyone in the region.
- The three-year, three-state Virgin River Instream Flow Study initiated by the BLM in Utah just finished its second year. The study is critical to determine the water requirements needed to protect the water-based resource values on BLM administered lands within the Virgin River watershed. Flowing through Utah, Arizona and Nevada, the Virgin's water is under heavy demand for municipal, industrial and agricultural uses.
- Ecosystem oriented, watershed-based management plans are under development for several areas in Wyoming, including the Twin Creek/Hall Creek Coordinated Resource Management Plan, Jack Morrow Hills Ecosystem Plan, Moxa Arch Mitigation Plan, Big Piney/LaBarge Coordinated Activity Plan, LaBarge Creek and Green River Wetlands project packages, Currant Creek/Little Mountain showcase HMP and the Wheat Creek Meadows Development Project.

TRAINING FOR THE FUTURE

The BLM's Phoenix Training Center has many training courses that support Ecosystem Management. These include Meeting the Biodiversity Challenge (three courses in 1993), Applied Biodiversity Conservation (2 courses), Introduction to Ecological Monitoring (3 courses), Managing for Biotic Diversity, Watchable Wildlife: Spotlight on Diversity, and Birds in the Ecosystem: Field Techniques and Management Options.

FISH AND WILDLIFE 2000

Since its development in 1987, *Fish and Wildlife 2000* has provided a strategy for managing the 3,000 species of vertebrates that occur on public lands. With over 270,000,000 acres, BLM manages more fish and wildlife habitats than any other organization and, in fact, is the largest public land manager in the world. Importantly, these lands also include the greatest variety of ecosystems and habitats of any agency, ranging from the Mojave and Chihuahuan deserts in the southwest to alpine tundra in Colorado and arctic tundra in Alaska.

Implementation of *Fish and Wildlife 2000* has been guided by a number of national strategy plans that specify goals and objectives for particular groups of species. These strategic plans have been written by teams including biologists from BLM, from other agencies and from conservation organizations.

The following Strategic Plans are currently being implemented:

WILDLIFE
- Desert Bighorn Sheep Habitat Management
- Nongame Migratory Bird Habitat
- Raptor Habitat Management
- Upland Game Bird Habitat Management
- Watchable Wildlife
- Waterfowl Habitat Management on Public Lands
- Waterfowl Environments Today and Tomorrow

FISH
- Fisheries Habitat Management
- Anadromous Fish Habitat Management
- Resident Fish Habitat Management

SPECIAL STATUS SPECIES
- Desert Tortoise
- Rare Plants and Natural Plant Communities
- Special Status Fishes

ADMINISTRATIVE
- Wildlife and Fisheries Information System
- Career Management Team Findings for Wildlife and Fisheries Biologists
- Training BLM Wildlife and Fisheries Program Personnel
- Staffing for the BLM Wildlife And Fisheries Program

Increasingly, the BLM is shifting away from single species management and toward an ecosystem perspective, as detailed in the previous section. This approach also has broadened the scope of species that receive management attention from traditional game species to such groups as neotropical migratory birds, bats, reptiles and amphibians. We know that to conduct truly effective management at the landscape level, even more of its components, such as insects and soil microfauna, must ultimately be understood and accounted for.

ECONOMICS OF WILDLIFE-ASSOCIATED RECREATION

> *"In 1991, more than half of the people in the United States 16 years old and older enjoyed some type of wildlife-related recreation."*

These words from the *Foreword to the 1991 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* say plainly how important wildlife resources are to the American people. While the pleasure of seeing a Golden Eagle soar over a wilderness canyon or watching a Chinook Salmon leap a waterfalls have always been of immense aesthetic value, it's only recently that economists have been able to measure the economic importance of these nonconsumptive values. Together with the more readily quantified economics of hunting and fishing, we are now able to estimate with ever more confidence the contribution of wildlife to the nation's economy. *In 1991, these expenditures totaled $59 billion dollars.*

Traditional commodity production is no longer the only, or even the major, contributor to local economies. Nonconsumptive uses have increased dramatically in the last decade as demographics and values of the American people evolve. Thus, these alternative sources of income are more important than ever. Selected economic factors for public lands are presented in the table below.

Economic Importance of Hunting, Fishing and Nonconsumptive Wildlife Recreation on Public Lands

Economic Factor	Total
Total hunting days[1]	65.1 million
Total fishing days[2]	157.1 million
Annual nonresidential nonconsumptive days[1]	287.6 million
Annual hunting expenditure[1]	$3.3 billion
Annual fishing expenditure[2]	$4.7 billion
Average annual expenditure for nonconsumptive wildlife recreation[1]	$3.9 billion
Industrial activity (output)[3]	$7.4 billion
Sales tax[3]	$199.5 million
Jobs[3]	138.4 thousand
Earnings[3]	$34.0 billion
Income tax[3]	$79.9 million

[1] 1991 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

[2] 1985 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

[3] Sport Fishing Institute, 1989.

Public Outreach

Environmental Education

During the early 1990's, Environmental Education (EE) programs and activities began popping up all across the U.S. This surge sparked the revision of old curriculums and the development of new ones to improve the environmental literacy of the Nation. Despite having no formal program for more than a decade, employees all across the Bureau have made many contributions to environmental education programs, both on and off the job.

The Wildlife and Fisheries Program has long recognized the need to keep Americans in touch with our wildland resources and provided strong support for teaching all citizens about them. BLM's field professionals participated in a great many EE activities in 1993, including visiting classrooms to help teach students about natural resources, hosting field trips and other activities with school groups and participating in career counseling for students to alert them to natural resource profession opportunities.

Other highlights in FY93 were:

- BLM's Wildlife Appreciation Program Manager was selected to serve on the Western Regional Environmental Education Council (WREEC). The Council sponsors development of EE curricula and materials, including the two most widely used natural resource education curricula in the country today, Project Learning Tree and Project WILD.
- Participating in the development of Project WET, a new national EE curriculum about water, also sponsored by WREEC.
- Participating in the National EE Summit sponsored by the National Fish and Wildlife Foundation. The Summit was convened to form a consortium of organizations and agencies who would work together to improve environmental literacy in the U.S., particularly related to fish, wildlife and plant resources.
- Alaska BLM sponsored two sessions of 'Outdoor Week' in both Anchorage and Fairbanks. Elementary school children were invited to spend the day with BLM resource experts, discovering the wonders of the great outdoors. The annual project is hosted by the Anchorage District at the Campbell Tract Facility, and the three Districts (Arctic, Kobuk and Steese/White Mountains) in Fairbanks.
- California's Eagle Lake Resource Area staff and Fort Sage School District are cooperating in the Adopt-A-Stream program, part of a National Science Foundation environmental education program. The resource area is the lead in working with the school district and other organizations to initiate the broader Adopt-A-Watershed program.
- The California Desert Information Center has completed an outdoor wildlife habitat display that features endangered and sensitive species living in the Mojave Desert. Additional wildlife habitat and natural history displays were installed along the Plant

Community Loop Trail at the Center to help visitors identify common desert plant species.

- THERE'S LIFE IN DEAD TREES! The 'Sammy the Snag' life-sized puppet and assorted puppet critters carry the Animal Inn message to students and adults in Northern Idaho and elsewhere.
- Boise District's Bruneau Resource Area hosted over 900 students during Snake River Birds of Prey Area Environmental Education Days. Activities included a native animal display and presentation by 'Critter Man,' and student participation in a Project WILD ecology activity.
- Youth Environmental Services, a Colorado learning workshop for young women, participated in the inventory of ten miles of stream and associated riparian habitat in the Uncompahgre Basin Resource Area. Other group riparian learning sessions included field trips to riparian areas and wetlands, students planting cottonwood trees, during National Environmental Education Week, and the Durango High School Ecology Club assisting in collection of macroinvertebrates on Cunningham Creek.

Watchable Wildlife

The network of wildlife viewing areas on public lands provides opportunities for watching everything from moose to hummingbirds. Mirroring the growth of Watchable Wildlife across the Nation, the BLM is continuing work with our many partners in moving this important conservation initiative forward.

Developments range from joint State wildlife viewing guides, to joint funding of Watchable Wildlife specialist positions. On-the-ground, the development of wildlife viewing areas is taking place around the Bureau, with many partnership endeavors.

State Watchable Wildlife guidebooks in which the BLM has been a major partner now include Arizona, California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, Texas, Utah and Washington. Other BLM participation includes the New Mexico guidebook, now in preparation, and revision of the original Oregon Wildlife Viewing Guide.

Other Watchable Wildlife highlights in FY93 are:

- Entering into an Alaska Watchable Wildlife strategic planning partnership through a Memorandum of Understanding with 20 other Federal, State and private organizations to 'encourage partnerships, cooperation and coordination of sustainable watchable wildlife and ecotourism opportunities on federal, state and private lands.'
- Identifying Watchable Wildlife viewing opportunities along 200 miles of Alaska's Dalton Highway in conjunction with the Dalton Highway Recreation Area Management Plan.
- Completion of the Nome Creek Watchable Wildlife site inventory, focusing on Alaska's nongame bird species.
- Producing a BLM-Alaska Watchable Wildlife brochure which identifies wildlife viewing opportunities on BLM public lands throughout the state.
- Completion of a project plan for the Betty's Kitchen Wildlife Interpretive Area in Yuma District, submitted as part of a proposal to receive matching funds from Arizona State Parks for site improvements.
- The Lower Gila Resource Area features Watchable Wildlife to inform the public about Arizona riparian communities along the Hassayampa River. Twenty-one interpretive signs and displays have been installed along a riverside path at a highway rest stop that receives an estimated 300,000 visitor days per year.
- The Phoenix Resource Area and Maricopa County Highway Department combined forces to install Watchable Wildlife signs along the popular Castle Hot Springs Road. Visitation exceeds 1,000 visitor days per week during the winter.
- In Arizona, Watchable Wildlife interpretive signs were purchased and installed at both the Muleshoe Cooperative Management Area and the San Pedro Riparian National Conservation Area.

- The California Desert District completed its district-wide Watchable Wildlife plan and subsequent project plans for wildlife viewing areas within the Afton Canyon Area of Critical Environmental Concern (ACEC), Harper Lake ACEC, Grimshaw Lake ACEC and Soda Springs ACEC.
- Using Land and Water Conservation Funds, the Arcata Resource Area acquired a strategic parcel in California's King Range National Conservation Area, that provides an ideal location for visitors to watch migrating California gray whales and other wildlife.
- In Colorado, destination and directional signing for seven wildlife viewing areas were constructed by the BLM, in cooperation with the Colorado Wildlife Heritage Foundation.
- Gunnison County contributed an estimated $5,000 in gravel and equipment operation time to construct a parking area for visitor's to Colorado's South Parlin viewing site.
- Idaho's Coeur d'Alene District acquired approximately 30% of the shoreline of Gamble Lake through a land exchange. The area will be managed for wildlife viewing and other recreation, primarily fishing.
- The Miles City District and Hysham Future Farmers of America are working together to develop the Howry Island Watchable Wildlife Viewing Area in Montana.
- An on-site celebration signalled the official opening of the Ely Elk Viewing Area in Nevada. Partners in the project included Nevada's Departments of Wildlife and Transportation, Division of Forestry, the Ely Elk Watchable Wildlife Advisory Group and the BLM. Among the improvements are off-highway parking areas, viewing mounds and interpretive signing.
- The Texas Wildlife Viewing Guide and Nevada Wildlife Viewing Guides were published.
- Travelers heading to Owyhee Reservoir in southeast Oregon's Vale District now have a roadside stop along the way that features an easy streamside trail and safe parking area.
- The Oregon State Office has developed an interactive computer video guide to Watchable Wildlife in the State. The touch-screen allows visitors to access an entertaining wealth of information about wildlife in Oregon: viewing area locations, site-specific viewing information, species occurrence and seasonal activities, wildlife watching tips and much more.
- In Wyoming, the BLM has been a strong partner in development of both the National Bighorn Sheep Visitor Center and the National Pronghorn Antelope Interpretive Center.

Partnerships and Challenge Cost Sharing

Much has been accomplished on the ground on public lands with the energy and assistance of many sportsmen and conservation-minded individuals. Individuals and organizations have given generously of their time, resources, and dollars to help maintain and improve game fish and wildlife habitat on public lands. A list of our partners appears in Appendix I.

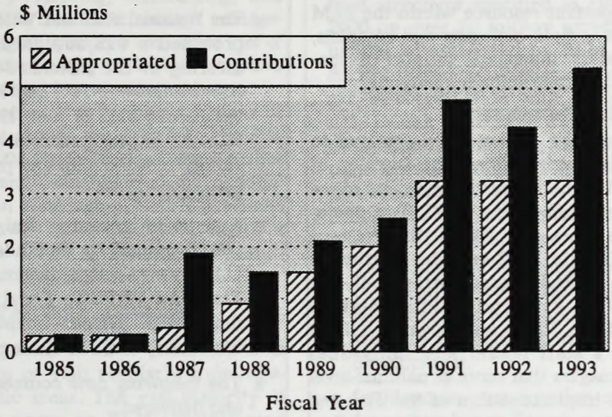
The *Fish and Wildlife 2000* Challenge Cost Share (CCS) program, which involves matching private contributions with federal dollars to conduct conservation work, has led to cost-effective improvements on public lands. The following table shows a cumulative private and State contribution of approximately 20 million dollars in CCS work in the years since 1987. These contributions have significantly exceeded BLM contributions.

The following are examples of accomplishments in FY93 that illustrate the value of partnerships.

- During a workshop for BLM Wyoming engineers, an engineer and biologist from Ducks Unlimited provided a one day presentation on wetland construction design/techniques to develop waterfowl habitat.
- Numerous courses offered by the Phoenix Training Center were designed, planned

Challenge Cost Share Funding History

BLM 1985-1993



and instructed in cooperation with our partners.

- In Alaska, Thematic Mapper scenes from Landsat imagery have been acquired in four areas of the state covering 26 million acres. Six million acres have been processed and analyzed using remote sensing and image processing developed in partnership with Ducks Unlimited to determine habitat availability and quality for waterfowl. The entire technology package, valued at $3 million, is currently being transferred to BLM.

- Members from the Southern California State Committee and 5 chapters of Quail Unlimited have assisted BLM and the California Division of Forestry by adopting the 50,000 acre Caliente National Cooperative Land and Wildlife Management Area. Quail Unlimited members have inspected and repaired guzzlers, constructed protective fences and conducted annual brood counts as part of this cooperative effort. Quail Unlimited will expand their work to include brood counts in the 306,422 acre Monache-Walker Pass National Cooperative Land and Wildlife Management Area.

- At the Cosumnes River Preserve, in California, 500 acres of farmland were restored to wetlands through a $740,000 cost share project with BLM, Ducks Unlimited, The Nature Conservancy and the agencies participating in the Central Valley Habitat Joint Venture. BLM in California manages this wetland complex in cooperation with Ducks Unlimited.

- In Arizona, the Lake Havasu Fisheries Improvement Program began installing 140,000 fish habitat structures to provide spawning sites, escape cover, and feeding areas for small fish. Angler access was improved through construction of eight recreational fishing sites including fishing docks and access for the handicapped are currently under construction.

HUMAN RESOURCES

A dedicated, technically competent workforce strategically located in BLM Field Offices, State Offices and in national leadership offices is vital to the successful implementation of *Fish and Wildlife 2000*. Indeed, the most important resource within the BLM is the people — field biologists and botanists, program leaders, managers, support personnel and public affairs staffs bureauwide.

Improving Staff Infrastructure

Supporting the Director's initiative to strengthen field capabilities, the Division of Wildlife and Fisheries restructured its office functions and staff during FY93. Two operations offices were established: the Western Fish and Wildlife Staff and the Southwest Threatened and Endangered Species staff.

The Western Fish and Wildlife Staff is located in Boise, Idaho and Logan, Utah. It consists of a staff leader and individual Program Managers that serve as national-level catalysts for implementation of the *Fish and Wildlife 2000* strategic plans. Additional Program Manager positions remain to be filled.

The Southwest Threatened and Endangered Species Staff is located in Phoenix, Arizona and currently consists of a single staff expert for BLM's field offices.

These two new offices will substantially improve the efficiency of implementing *Fish and Wildlife 2000*. The placement of Program Managers in the West will reduce staff travel expenses, strengthen the continuity of national policy between Headquarters and Field Offices, enhance cooperation with Western constituencies, and allow the Washington Office staff to focus more on issues involving Congress and Administration officials.

Training

The BLM is continually striving to enrich the work experience and sharpen the skills of its biologists and botanists. This includes upgrading key positions, enlarging the staff infrastructure to provide enhanced career opportunities, and providing a variety of training courses, primarily through BLM's Training Center in Phoenix, Arizona.

- A new *Fish and Wildlife 2000* Strategic Plan, *Strategy Plan for Training Personnel in BLM Wildlife, Fisheries and Special Status Plant Program*, was completed. For the first time, a comprehensive analysis for training needs and course offerings is available to guide efficient use of training resources.
- The National Fish and Wildlife Foundation provided a $15,000 grant for the third offering of the *Advanced Leadership and Administration of Fish and Wildlife Programs* which was held in June 1993. Fourteen of BLM's best biologists received training on a variety of leadership and program management techniques.
- Assistance in course design and delivery was provided by Defenders of Wildlife, U.S. Forest Service, National Park Service, Fish and Wildlife Service, Ducks Unlimited, the Arizona Chapter of The Wildlife Society and The Nature Conservancy.
- The following new courses were designed and delivered:
  - *Introduction to Administration of Wildlife and Fisheries Programs*
  - *Meeting the Biodiversity Challenge*
  - *Applied Biodiversity Conservation*
  - *Watchable Wildlife*
  - *Inventory and Monitoring of Special Status Plants*
  - Several new GIS training courses with wildlife resource components
- A training/workshop was delivered by Ducks Unlimited and the Western Fish and Wildlife Staff to teach BLM engineers "state-of-the-art" construction techniques for wetland habitats.
- The courses *Wetlands and Waterfowl Management* and *Management of Avian Communities: Local and Landscape Perspectives* were designed for delivery in FY94

WILDLIFE HABITAT MANAGEMENT

Goal: Ensure optimum populations, natural abundance, and diversity of wildlife resources on public lands by restoring, maintaining, and enhancing habitat conditions through management plans, integrating actions with other uses of public lands, coordinating with other programs and directing habitat improvement projects.

Goals and objectives for management of various species groups are guided by the *Fish and Wildlife 2000* Strategic Plans listed earlier in this report and available from our national headquarters in Washington, D.C. The visions of these plans are becoming more congruent at the close of FY93 as the need for landscape-level management emerges.

AVIAN HABITAT MANAGEMENT

Over 800 species of birds either breed in North America or visit regularly from adjacent geographic areas. The vast majority of these species occur on BLM-administered lands during some period of the year. Because birds occur in nearly every conceivable niche in the landscape, are relatively easy to observe and are sensitive to changes in environmental quality, this group is especially important as indicators of ecosystem health and management success.

We have addressed the management of these species through four different strategic plans:

Waterfowl Environments Today and Tomorrow — Waterfowl

Upland Game Bird Habitat Management — Grouse and quail

Raptor Habitat Management — Eagles, falcons and hawks

Nongame Migratory Bird Habitat — Shorebirds, hummingbirds, woodpeckers, warblers and all other species

Waterfowl Environments Today and Tomorrow (WETT)

Goal: Help perpetuate a diversity and abundance of waterfowl for the Nation by managing the wetlands and other habitats on the public lands that are of importance to the maintenance of this international resource.

The BLM's national strategy plan 'Waterfowl Habitat Management on Public Lands,' identifies specific areas to achieve the waterfowl objectives specified in *Fish and Wildlife 2000* on over 20 million acres of waterfowl habitat administered by BLM. In 1993, the BLM's Waterfowl/Wetlands Program Manager, in coordination with BLM field personnel, Ducks Unlimited and other organizations, finalized the implementation strategy plan entitled Waterfowl Environments Today and Tomorrow.

Some of the accomplishments associated with WETT in FY93 were:

- The BLM has enhanced and/or created more that 107,551 acres of waterfowl habitat in 10 states while another 4,780 acres of wetland projects are in various stages of development.

- In Montana, construction of 2.0 miles of fence to enhance Canada goose molting use and duck nesting on 3 miles of Lima reservoir shoreline in addition to enhancing 200 acres of adjoining wetlands.

- In Wyoming, the Green River Ecosystem plan was drafted which will involve the restoration, enhancement and creation of some 150,000 acres of identified waterfowl habitat.

- Transfer of the remote sensing technology developed by Ducks Unlimited is currently being completed to provide BLM Alaska and all BLM states with the ability to gather, interpret and map wetlands/waterfowl habitat.

- A 'Cooperative Wetland Project Review Team' was established with the Bureau of Reclamation and BLM states within the Great Plains region to identify and implement wetland enhancement/creation projects.

- The 'Lost Slough' wetland project which created 390 acres of waterfowl/wetland habitat at The Cosumnes River Preserve in the Central Valley of California was completed in cooperation with Ducks Unlimited and The Nature Conservancy. This area will provide critical wintering habitat for thousands of waterfowl and shorebirds annually.

- Seventy acres of waterfowl/wetland habitat was created at the Dean Creek Elk Viewing Area in Oregon. The waterfowl component of the area was created to provide production and migration habitat for waterfowl and shorebirds.

Upland Game Birds

More than 23 species of upland game birds, including quail, grouse, ptarmigan, Chukar, pheasant and wild turkey are found on BLM lands. Across the nation, upland game bird populations are well below historic levels. Urbanization, industrialization and conversion for agricultural uses have eliminated millions of acres of upland game bird habitat and degraded millions more.

Two native species, the Heath Hen and Passenger Pigeon, are extinct, and two others, Attwater's Prairie-chicken and Masked Bobwhite, are listed as endangered. Several other species have undergone huge declines in distribution and abundance. These include the Columbian Sharp-tailed Grouse, Greater and Lesser Prairie-chickens, Sage Grouse and Mountain Quail.

Yet we do have the ability to reverse population losses of upland game as exemplified by the Wild Turkey. Unregulated hunting and habitat degradation reduced their numbers from 10,000,000 birds to about 30,000 by the early 1900's. Restoration work began in the 1950's and today they number over 3,000,000 birds and increasing. Management can and does make a difference.

Selected accomplishments for FY93 include:

- Completed the Bureau-wide *Fish and Wildlife 2000* Strategic Plan, *Upland Game Bird Habitat Management — On The Rise* and traveling display.
- A draft Habitat Management Plan for Columbian Sharp-tailed Grouse was completed for the Hixon Reserve in Idaho's Cascade Resource Area. The Idaho Department of Fish and Game and The Nature Conservancy have been deeply involved in this critical habitat area where riparian plantings, upland shrub plantings, fence construction and habitat acquisition are being used to rebuild populations of this rare grouse.
- A cumulative impacts analysis of the effects of livestock grazing management and vegetation manipulation on Sage Grouse was conducted in the Shoshone Basin, Burley District, Idaho. The Idaho Fish and Game Department contributed by tracking radioed grouse movements and habitat use.
- Members of 6 southern California chapters of Quail Unlimited have assisted the Caliente Resource Area by adopting the 50,000-acre Caliente National Cooperative Land and Wildlife Management Area. Volunteers have repaired water catchments, constructed fences and conducted annual brood counts.
- In New Mexico's Roswell Resource Area, completed annual Lesser Prairie-chicken lek surveys in Mescalero Sands and completed a survey for Montezuma Quail at Ft. Stanton.
- Biologists in Montana's Powder River Resource Area inventoried over 70,000 acres for the presence of Sage Grouse and Sharp-tailed Grouse leks.
- In Oregon's Baker Resource Area, Columbian Sharp-tailed Grouse were reintroduced into historic habitat with the help of the Oregon Department of Fish and Wildlife, The Nature Conservancy and Eastern Washington State University.
- Quail Unlimited in California's Caliente Resource Area have expanded their volunteer effort to include brood counts on the 300,000-acre Monache-Walker Pass national Cooperative Land and wildlife Management Area. Data will be used in the Wildlife Habitat Improvement Program.
- In the Big Dry Resource Area, Montana, about 10,000 acres were put under special

livestock grazing management to improve vegetation for upland game birds. This was the first case in eastern Montana where Challenge Cost Share funds from outside BLM were used for grazing management.

- Rare Mountain Quail should benefit from the fencing of a portion of Canyon Creek in the Bruneau Resource Area, Idaho. The habitat is believed to be important for wintering birds and was previously enhanced by planting food plants.
- 12 miles of riparian habitat along Buck Creek, Deer Creek and Clover Creek in Idaho's Jarbidge Resource Area were surveyed for Mountain Quail, now nearly extirpated in the state. No quail were located but the sites are likely suitable for future reintroductions.
- Developed a pipeline watering system for the Lesser Prairie-chicken in the Roswell Resource Area, New Mexico, with the help of the Marathon Oil Company and Hobbs Quail Unlimited.
- 46,000 acres of habitat were surveyed for Sage Grouse and Columbian Sharp-tailed Grouse leks in the Burley District, Idaho.
- In the Baker Resource Area, Oregon, 148,000 acres were surveyed for the Western Sage Grouse and 25 new leks were discovered.
- Female Sage Grouse have been fitted with radio collars in the Jarbidge Resource Area, Idaho. Nest success and habitat selection by females with broods are being studied to improve understanding of their habitat needs.
- In Montana's Big Dry Resource Area, 285,000 acres were inventoried for Sage Grouse and Sharp-tailed Grouse leks. Much of the work was accomplished through a Challenge Cost Share agreement with the Montana Department of Fish, Wildlife and Parks.
- The Idaho Department of Fish and Game and the Idaho Bird Hunters Association fenced about 3/4 mile of riparian habitat for upland game birds around Rockvill Spring in Idaho's Owyhee Resource Area.
- In Idaho's Shoshone District, 70 acres were fenced, plowed and seeded with forage species desirable to Ring-necked Pheasants. These food plots in sagebrush habitat are especially effective in augmenting populations.

Neotropical Migratory Birds and Other Nongame Birds

BLM has been working to achieve the goals and objectives outlined in *Partners In Flight — Aves de las Americas*, a joint initiative to coordinate conservation efforts in Canada, the U.S., Mexico, the Caribbean, Central America and South America on behalf of birds that breed in North America and spend the winters in the New World tropics.

In July 1993, a Nongame Bird Program Manager was hired on the Western Fish and Wildlife staff to implement the Bureau's Nongame Migratory Bird Habitat Conservation Plan, which addresses not only neotropical migrants, but also all other avian species not covered in other strategic plans.

Our goal is to stabilize declining populations by helping determine the causes for declines, focusing on improved habitat management, and developing ecosystem-level management in cooperation with our many local, national and international partners. By the end of FY93 nearly every state agency and every major conservation organization in the western hemisphere have become actively involved in this unprecedented conservation effort.

Below are selected accomplishments for FY93.

- Nearly $500,000 in inventory, monitoring, habitat improvement projects and the production of educational materials were accomplished in FY93 with no new funding for this initiative.
- The training course *Birds in the Ecosystem: Field Techniques and Management Options* was designed.
- New bird checklists were developed in the following districts: Anchorage AK,

Fairbanks AK, Shoshone ID, Vernal UT, Safford AZ, Las Vegas NV, Battle Mountain NV, Ely NV, Carson City NV, Winnemuca NV, Lakeview OR and Spokane WA.

- Monitoring of bird populations during recovery of riparian vegetation have been initiated in the *Riparian Area Demonstration Project* on Marys River, Elko NV.
- In Montana, BLM and the Montana Riparian Association, a coalition of agencies, groups and academic institutions, have cooperated to evaluate and classify over 1000 miles of riparian habitat on public land. A study published in 1993 investigated how to link breeding bird community composition to the defined habitat types.
- The Idaho Falls District and the Forest Service are conducting a multi-year analysis of grazing and recreation effects on neotropical migrants nesting on the South Fork of the Snake River. This will be a major contribution to understanding the management of neotropical migrants in western riparian systems.
- A review paper, *Effects of Livestock Grazing on Neotropical Migratory Landbirds in Western North America*, was coauthored to identify knowledge gaps for species and habitats in the West.
- The Golden Eagle Audubon Society is helping BLM in the Boise District to determine avian responses to different management practices designed to reduce juniper woodlands. 54 species of birds are involved in the Challenge Cost Share project.
- The book, *Birds of East-Central Idaho*, authored by Hadley Roberts and illustrated by Erica Craig was published jointly with the Idaho Department of Fish and Game and The Wildlife Society — Idaho Chapter. The book covers 244 bird species occurring in Idaho's Upper Salmon River region.
- Roseburg District biologists began monitoring neotropical migrant use of old-growth in the Coast Range of western Oregon in conjunction with field work on the marbled murrelet.
- Along the Lower Owyhee Canyon Watchable Wildlife Area in Oregon's Vale District, volunteers from the American Birding Association are compiling a bird checklist. Scouts have helped restore vegetation through hand seeding and planting trees and shrubs. Next boxes and wire to protect trees from beaver were donated by the American Garden Club.
- BLM's Arizona State Office completed a Cooperative Agreement with the Arizona Game and Fish Department for work on the Arizona Breeding Bird Atlas Project extending for at least the next five years. Four BLM biologists serve as regional coordinators for the project and several biologists will participate in field work.
- Techniques for recovering populations of the endangered Hawaiian Crow or Alala are being tried on Common Ravens in the Bruneau Resource Area of southern Idaho. The Alala population is down to 11 birds in the wild and the closely related raven provides and invaluable surrogate. Research is in cooperation with the U.S. Fish and Wildlife Service and Greenfalk Consultants (Boise).
- BLM biologists in Arizona conducted a Southwestern Willow Flycatcher survey among agencies and groups in order to pick up additional records of this rare riparian bird.
- American Birding Association volunteers continued surveys for nesting neotropical migrants in the Desatoya Mountains of BLM's Carson City District. This isolated mountain range has been proposed as an Ecosystem Management/Biodiversity Project Area and also contains an Intermountain Wilderness Area Ecosystem Study site.
- Biologists are monitoring bird species diversity and abundance in the San Sebastian Marsh and San Felipe Creek of BLM's El Centro Resource Area near the U.S.-Mexican border in southern California. Habitat is being improved by prescribed burning and pothole blasting.

- Volunteer birders from the Black Canyon Audubon Society surveyed 2 riparian areas on the Uncompahgre Plateau in BLM's Montrose District, Colorado to help understand the links between specific riparian vegetation variables and bird species richness and density.
- In New Mexico's Taos Resource, 25 additional miles of the river were protected from cattle grazing by the construction of barriers at cattle crossings. All but 5 miles of this important migration corridor on public land are now protected. Monitoring of neotropical migrants is underway.
- Completed inventory of 50,000 acres of habitat for sensitive nongame bird species. This establishes baseline data for the South Elkhorn Landscape Analysis in the Headwaters Resource Area.
- Contributed to continent-wide bird population monitoring by conducting over 30 Breeding Bird Surveys in 11 western states.
- Alaska districts are working with Alaska Partners In Flight to establish Breeding Bird Surveys, off-road point counts and migration monitoring programs to gain information on the state's huge, and largely unknown, nongame bird situation.
- Work continued on the Colorado Breeding Bird Atlas, a 7-year project to document breeding bird species occurrence throughout the state. BLM provided funding, topographic maps, field workers and administrative support.
- 3,840 acres of potential SW Willow Flycatcher habitat was evaluated in New Mexico's Taos Resource Area.
- The Jackson District has published a checklist of Mississippi's neotropical migratory birds in cooperation with the Mississippi Natural Science Museum.
- Analysis of the Bureau's largest data set on avian habitat relationships continues at the San Pedro Riparian National Conservation Area in the Tucson Resource Area, Arizona. Results will have major implications for riparian area management across public lands.
- In Arizona's Tucson Resource Area, bird censusing has been expanded to include Chihuahuan grasslands, grazed vs. ungrazed riparian habitat at the Empire-Cienega Riparian Conservation Area and the Muleshoe Cooperative Management Area. Data will be used to revise the Area's Resource Management Plan.
- Oregon/Washington BLM has supported development of the Great Basin Neotropical Migratory Bird Handbook, which will provide a reference to the biological requirements and conservation status of neotropical migrants in the 5-state area.

Raptor Habitat Management

Goal: Provide suitable habitat conditions for birds or prey on public lands through the conservation and management of essential habitat components, including habitat for prey species, especially in areas where birds of prey concentrate during some period of the year, or in important habitats where populations are suppressed.

At the pinnacle of the biological food chain, many birds of prey species continue to receive special status because of threats to their existence and because of the fascination Americans have for these species. Raptor conservation is a major responsibility for BLM because an unusually large number and variety of these avian predators reside, winter or pass through BLM habitats.

Responding to this obligation, the BLM and its partners established the Raptor Research and Technical Assistance Center (RRTAC) in 1990. RRTAC is involved in several partnership activities such as working with the Raptor Research Foundation to produce *Wingspan*, a monthly newsletter about raptor research and management; updating the publication, *Suggested Practices for Raptor Protection on Power Lines*, with the utilities industry; and coordinating with the University of Minnesota's Raptor Research and Rehabilitation Center on the Mid-winter Bald Eagle Surveys across the North American Continent.

Below are selected accomplishments for FY93:

- Global climate change to track alterations in non-forest habitat through vegetation mapping and intensive ground-truthing.
- Passerine surveys to study bird habitat associations, density estimates and effects of habitat fragmentation through remote sensing and GIS technology.
- In New Mexico's Taos Resource Area, approximately 1,800 acres of Mexican Spotted Owl habitat was surveyed. Peregrine Falcon monitoring was also completed.
- An annual spring inventory of 101 raptor nests was completed to determine yearly nesting productivity of the peregrine falcon, prairie falcon, ferruginous hawk, and golden eagle in the Farmington District, New Mexico. BLM coordinated with the Navajo Fish and Game and used several volunteers in this monitoring.
- In the Farmington District, New Mexico, an activity plan is being developed for the Bald Eagle Area of Critical Environmental Concern, which contains one of the largest wintering concentrations of Bald Eagles in the southwest.
- Las Cruces, New Mexico, District completed the second year of Mexican spotted owl inventory; owls have not been found on public lands.
- The Socorro Resource Area, New Mexico, is continuing with several years of inventory and monitoring of about 30 Ferruginous Hawk nests, the southern most population of these hawks.
- An interagency Challenge Cost Share agreement between the Department of Energy, Waste Isolation Pilot Project Site, and the BLM Carlsbad Resource Area supports ongoing raptor research and monitoring in the Los Medanos raptor area.
- The Dillon District in cooperation with the Montana Natural Heritage Program continued their long-term studies of Ferruginous Hawks in southwestern Montana where densities rival those from any other area.
- The population of rare Gray Hawks in the San Pedro Riparian National Conservation, Arizona, has increased from 9 to 18 occupied nests as a result of improved riparian habitat conditions.
- In cooperation with the California Energy Commission, the San Joaquin Valley was monitored for winter use by Swainson's Hawks.
- California BLM and the Institute for Bird Populations are completing a census of Burrowing Owls in Kern County. This is only part of a broader inventory in cooperation with the Institute and local Audubon chapters.
- 46.5 miles of the Upper Missouri National Wild and Scenic River in Montana were surveyed for Peregrine Falcons and other raptors. Over half the cost was contributed through a Challenge Cost Share agreement.
- The Miles City District, Montana, completed evaluation of Bald Eagle winter habitat along the Little Missouri River. Nests were monitored along the Tongue and Yellowstone Rivers.
- In the Headwaters Resource Area, Montana, 50,000 acres of habitat were inventoried for Ferruginous Hawk nesting pairs through a Challenge Cost Share agreement with Montana State University.
- Winter Bald Eagle surveys were conducted along the Snake River, throughout Cassia County and in the Bowen Canyon Roost Area of Critical Environmental Concern in Idaho's Burley District. Acquisition of key private lands was pursued in the Bowen Canyon Roost area.
- The eighth annual Gray Hawk nest monitoring survey was conducted in Arizona's San Pedro Riparian National Conservation Area, where 40% of the U.S. population occurs. The population appears to be increasing steadily as a result of improved habitat management along the San Pedro.
- Raptor surveys were conducted at the Muleshoe, Empire-Cienega Resource Conservation Area and San Pedro Riparian

National Conservation Area in the Tucson Resource Area. Several U.S. rarities such as the Black Hawk, Zone-tailed Hawk and Gray Hawk nest in these areas.

- The Spokane District cooperated with the University of Washington to inventory habitat for the Northern Goshawk and Burrowing Owl.
- Oregon's Lakeview, Salem, Roseburg, Coos Bay and Eugene Districts have completed habitat inventories and monitoring plans for Bald Eagles.
- Peregrine Falcon nest sites were monitored in the Coos Bay and Roseburg Districts, Oregon.
- Food habits, productivity and habitat selection by nesting Saw-whet and Screech Owls in Idaho's Bruneau Resource Area is being studied to better understand the species' distribution, density and management needs. Boise State University is cooperating through a Challenge Cost Share agreement.

TERRESTRIAL HABITAT MANAGEMENT

Big Game

Goal: Ensure that big game species on the public lands are provided habitat of sufficient quantity and quality to sustain identifiable economic and/or social contributions, to the American people.

Big game populations have increasingly continued to significantly impact local and state economies by providing year round consumptive and non-consumptive recreational opportunities. Recognizing this, the BLM strives to maintain healthy big game populations through appropriate habitat management.

Examples of these efforts in FY93 included:

- In Wyoming, habitat monitoring studies were conducted on over 100,000 acres of antelope habitat. In addition, fifteen miles of net wire fence were modified to enhance access by antelope to key habitat.
- In California, Tule elk populations were monitored and 1500 acres of additional acres of important elk habitat were acquired.
- In the Winnemucca District, Nevada, the One Shot Antelope Foundation and Nevada Department of Wildlife constructed 2 of 4 planned water catchments to allow pronghorn to use more habitat in the Little Owyhee Desert.
- In Idaho, some 15,450 acres of a key elk and mule deer winter range burned in wild fires on BLM lands. BLM Idaho began emergency rehabilitation through areal and ground seeding of 13,600 acres at a cost of $635,000.
- Forage was improved on 300 acres of elk winter range at Terror Creek, Colorado by way of a controlled burns. In Disappointment Valley, 4 springs were improved by Colorado BLM to improve the distribution of wintering big game.
- Near Coos Bay Oregon, BLM personnel continue to seed key big game areas, particularity for Roosevelt elk with desirable forage species. This seeding effort to date has covered over 1000 acres.
- Intensive habitat monitoring is being conducted in California's round valley winter deer herd range to better understand vegetative responses to periodic climatic changes and its effect on overwinter deer survival/mortality.
- BLM personnel along with the California Department of Fish and Game and the Nevada Department of Wildlife are conducting population trends of migrating Doyle and East Lassen deer herds. Deer were captured and radio collared to determine movements, habitat usage and mortality.
- The Texas Hill prescribed burn in New Mexico was conducted on 15,000 acres to benefit mule deer winter range. An exclosure/pipeline-wildlife watering facility, and ten inverted umbrella water catchments were installed to provide reliable water sources.

- Montana BLM inventoried 35,000 acres of bighorn sheep habitat to identify lambing habitat and spring distribution. Reintroduction of 35 head of bighorn sheep was conducted in the Sleeping Giant Habitat Management Plan.
- BLM in California, in cooperation with California Department of Fish and Game transplanted forty four Nelson's bighorn sheep from Old Dad Peak area to Brostol, Sheep Hole and Bullion Mountains in an effort to augment reestablished herds.
- The Bunyan Peak redevelopment project in Arizona reengineered a faulty water catchment design by using new and different materials. The refit insured year round water for this particular desert bighorn sheep herd established by transplant. Additional construction of catchments of the new design are now planned.
- Approximately 56 miles of canyon habitat along the Jarbidge and Bruneau river as surveyed by BLM and Idaho Fish and Game biologists to determine habitat suitability for big horn sheep introductions. Environmental Assessments are currently being written to allow for these bighorn sheep transplants/introductions.

Amphibians and Reptiles

Aside from amphibian and reptile species that are currently threatened or endangered species or candidates for listing, relatively little attention has been given to inventory, monitoring and management of these groups. This is a result of limited funding, limited personnel and higher priority workloads.

Yet recent concern over global declines of amphibians and disappearance of entire populations in certain areas of the West has abruptly brought them back into view. Unfortunately, other agencies and institutions are in little better position to understand what is happening to amphibian populations because there simply has never been enough interest in these species to gain even basic biological data on things like species' distributions and relative abundances.

Amphibians are closely linked to aquatic and moist upland ecosystems and are very sensitive to the water quality in their surroundings. Thus, they are one of the best indicators of environmental quality on the landscape.

Accomplishments in FY93 include:

- Completed third year of study on the Dune Sagebrush Lizard in the Caprock Wildlife Habitat Area, New Mexico, to evaluate effects of vegetation manipulation and livestock grazing on this state-listed species (Challenge Cost Share project with New Mexico Department of Game and Fish).
- Completed the second year of amphibian and reptile inventory along all 21 creeks on public lands within the Hollister Resource Area, California. These populations comprise a significant portion of the species' total populations in the inner south coast ranges in the state.
- The Mimbres Resource Area, New Mexico, has been working with the NM Dept. of Game and Fish to monitor populations of the Grey-checkered Whiptail.
- The New Mexico Department of Game and Fish is currently completing the third year of research on the River Cooter turtle and the Blotch Plain-bellied Water Snake. Information collected through this Challenge Cost Share project will be used to develop plans for the protection and enhancement of two species' habitats.
- In Arizona, 2,000 acres were surveyed for Mexican Garter Snakes and Lowland Leopard Frogs in conjunction with riparian monitoring.
- Arizona BLM, in cooperation with three partners, began research on monitoring techniques, distribution, habitat requirements and population biology of the Flat-tailed Horned Lizard.
- The Medford District, Oregon, completed inventories of the Western Pond Turtle, a species proposed for listing as threatened or endangered.

Bats

Bats are another group of animals that

often play critical roles in western ecosystems but that simply are not well understood. Their nocturnal behavior, inaccessible breeding and roosting sites and migratory behavior have made them difficult to study. As a result, we know little of their basic ecology or management needs on public lands. Nevertheless, because bats often use human dwellings, bridges and mine shafts, there is a clear opportunity to begin specific management actions to protect this diverse and fascinating group of mammals.

Selected FY93 accomplishments include:

- Signed a Memorandum of Understanding with Bat Conservation International to further education and management of bats on public lands.
- Initiated policy discussions to ensure that abandoned mines that are used by bats for roosting are managed to protect bats while continuing to safeguard the public from hazardous situations.
- In the Barstow Resource Area, California, inventoried the Pisgah Crater Lava Tubes for bats in preparation for an Area of Critical Environmental Concern management plan.
- Also in the Barstow Resource Area, inventoried mine shafts for bats in the vicinity of the Old Dale and Joshua Tree National Monument.
- In the Phoenix District, BLM and the Arizona Game and Fish Department surveyed old mine shafts for bat roosts. Over 5,000 acres were sampled for the presence of special status bats using mist nets.
- Initiated the *Fish and Wildlife 2000* Strategic Plan, *Batting 2000.*
- Habitat for Townsend's Big-eared, Pallid and Fringed Bats was surveyed in Oregon's Medford District.

Other Species

The Bureau has continued to bring more species and species groups under the purview of resource management as the agency has escaped its tradition-bound roots. Invertebrates are almost totally out of the sphere of consideration unless they are pests or have special status. The BLM will bring more of these poorly known components of biotic communities into perspective as we establish our Ecosystem Management strategies.

In FY93, the following accomplishments are noteworthy:

- The Jackson District, Mississippi, is cooperating with the U.S. Fish and Wildlife Service and Fort Chaffee in Arkansas to monitor and protect a newly discovered population of the endangered American Burying Beetle while developing the area's natural gas resources.
- Entrance and directional signs were placed at strategic points within the Armargosa Canyon and Grimshaw Lake Areas of Environmental Concern in California to help protect habitat for the rare Armargosa vole.
- The Salem District, Oregon, completed inventories for the Mary's Peak Blind Beetle in cooperation with the Oregon Natural Heritage Program. A new genus of beetle may have been discovered.
- 2,000 acres in the Burley District, Idaho, were surveyed for presence of the Idaho Dune Tiger Beetle.

FISHERIES HABITAT MANAGEMENT

The BLM currently administers around 169,000 miles of stream and associated riparian habitat; 2.4 million acres of lakes; and about 173,000 acres of reservoirs. Most of the stream miles and acres of lakes are located in Alaska. In California, Oregon/Washington, and Idaho, the BLM manages over 2,000 miles of stream with anadromous fish; over 600 miles of stream historically occupied by anadromous fish; and another 6,000 miles influencing conditions in anadromous streams. These stream miles are located in 104 different watersheds containing over 140 stocks of anadromous salmon, steelhead, and sea-run trout that are at moderate to high risk of extinction.

In the Intermountain West, the BLM waters provide excellent opportunities for anglers to catch more than a dozen distinct forms of native trouts. The southwest deserts contain a diverse array of desert ponds and springs harboring many unique fish species adapted to live in these harsh environments.

Some limited progress has been made in implementing the Anadromous Fish and Fisheries Habitat Management Strategy Plans. The Special Status Fishes Management Strategy Plan, completed in 1992, is now in the beginning phases of implementation. Many miles of stream and associated riparian habitat have been treated to try to improve fish production, especially in those watersheds containing Federally listed species and/or streams containing fish of high risk of extinction.

Anadromous Fish Habitat

Goal: Conserve and restore stocks of Pacific salmon and anadromous trout on BLM lands of the western United States. More specifically, maintain the quantity, quality, diversity, and complexity of fish habitats needed to conserve and restore all remaining stocks of western anadromous salmonids on lands managed by BLM.

The Anadromous Fish Habitat Management Plan is currently being revised, updated, and tiered to the development of three specific regional initiatives: Columbia Basin, Coastal, and Alaska. These three distinct anadromous fish regions require somewhat different strategies to manage habitats and species.

Columbia Initiative

The Columbia and Snake River Basins Initiative, originally prepared for the Salmon Summit in 1991, was updated in 1993 for the Northwest Power Planning Council. This initiative identified management actions, projects, support, and land acquisition costs of $174.6 million over the next eight to implement the initiative. The BLM administers about 920 miles of streams in 52 watersheds currently used for spawning and/or rearing anadromous salmonids in the Willamette, Columbia, and Snake River Basins.

The BLM also manages another 777 miles of stream located below and above major dams with and without passage that currently do not have fish runs because they are either dewatered or fish have no access. Also, 2,884 miles of stream and over three million acres in 52 subbasins partially managed by BLM contribute to the quality of habitat in fish producing streams. Of the 52 subbasins with BLM managed lands, 18 watersheds contain three listed species and another 39 watersheds contain 42 anadromous stocks currently at risk of extinction or of special concern. Also, many of these watersheds support anadromous and resident populations of sensitive salmonids, including wild steelhead trout, bull trout, inland Columbia Basin redband trout, and the westslope cutthroat trout.

- In Idaho, the Coeur d'Alene District inventoried 39 miles of stream to gather baseline information on riparian and instream conditions to determine habitat potential for improvement and trend. Also, a seven-mile segment of Big Canyon Creek that runs subsurface was examined by a consultant to design a project to provide perennial flows to improve anadromous fish habitat.
- In Idaho, the Salmon District inventoried 56 drainages, including 50,000 acres and six miles of stream, with listed salmon populations. Also, another 121 miles of stream were inventoried using aerial photography and 38 key areas were monitored for macroinvertebrates and vegetation. In the Lemhi Basin, one mile of stream was restored.
- In Oregon and Washington, the Spokane, Prineville, and Vale Districts intensively inventoried conditions on 141 miles of anadromous fish streams and extensively inventoried another 700 miles of stream using aerial photography. Monitoring and evaluation of 277 grazing parcels was completed to determine affect on federally listed Snake River chinook salmon. Project design and development were completed on 37 habitat improvement projects.

Coastal Initiative

The Coastal Initiative was completed in 1993. The total cost of all management actions described in the initiative would be approximately $118,210 million over the next ten years starting in FY94. The BLM manages 1,170 miles of coastal streams in Oregon, Washington, and California accessible to anadromous salmonids and another 37 miles of historic habitat now located above dams. Another 4,125 miles of perennial and intermittent streams (some containing resident trout populations) and over 2.2 million acres of riparian and upland habitat influence conditions in streams used by anadromous salmonids.

In coastal watersheds where BLM has management responsibility, approximately 20% of the land is under BLM ownership. Of the 146 coastal basins containing anadromous salmonids, BLM manages streamside land in 52 watersheds containing at least 102 of the 275 coastal stocks with a moderate to high risk rating. In 18 major watersheds of coastal Oregon, BLM manages 929 miles or 17% of the total 5,463 stream miles.

- In coastal Oregon, the Coos Bay District completed restoration projects in the Smith and Coquille River Basins. The projects, along six miles of six streams, improved habitat conditions for chinook and coho salmon, and steelhead and sea-run cutthroat trout, at a cost of $50,000.

- The Medford District completed inventories and surveys on 70 miles of anadromous fish streams. A stream temperature study, with 120 sites, was initiated in the Rogue River to monitor the effects of higher temperatures on anadromous salmonids. Also, a study was started to evaluate the effects of boats on juvenile salmonids in the Rogue River, at a cost of $107,000.

- The Salem District completed a project to access a historic secondary channel in the Salmon River (Sandy drainage) to improve coho salmon and steelhead spawning and rearing, at a cost of $12,000. The district also inventoried over 15 miles of stream in the Alsea, Siletz, Scappoose, and Sandy River Basins.

- In California, the Ukiah District, through funds from the Trinity River Task Force, constructed four side channels. The channels, which paralleled the Trinity River, were 3,400 feet in length and constructed to provide rearing habitat for young salmon and steelhead and increase riparian habitat. This effort is part of an ongoing program authorized by congress to restore lost anadromous fish and their habitat within the Trinity River Basin from the construction of the Clair Engle Dam.

- In California, the Arcata RA completed a riparian/aquatic habitat improvement project for anadromous fish in the Mattole River Basin. Work was accomplished with $20,000 funding from California Department of Fish and Game and on-the-ground efforts of the Mattole Restoration Council.

Alaska Initiative

BLM manages around 135,300 miles of fishable stream, containing anadromous and/or resident fish. In Alaska, anadromous habitats have been detrimentally impacted primarily by placer mining operations and timber harvest. Although current damage is not widespread, the inaccessibility has lead to little information regarding habitat conditions, overall fish production, and the extent of potential problems.

Because of the vast potential for fish production and the dominant pristine stream conditions, much more work needs to be done to inventory and monitor existing conditions and potential changes from effects of mining and logging.

- In Alaska, the Glenallen District initiated the first year of a three year study to determine rearing habitat values for steelhead trout in the Gulkana River, a Wild and Scenic River. The study is being done under the cooperative agreement with the U.S. Fish and Wildlife Service Cooperative Research Unit at the University of Alaska-Fairbanks, and in consultation with Trout Unlimited, Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service.

- In Alaska, the Kobuk District completed and began implementation of two plans designed to protect important anadromous fisheries habitat in streams within the Hogatza and Indian River drainages, part of the Yukon River system. These areas are designated as ACEC's because they harbor important chum salmon spawning and rearing habitat.

Resident Fish Habitat Management

Resident fish species include all those not classified as anadromous or special status. Emphasis will be on managing for the biological integrity of aquatic ecosystems and associated watersheds to provide economic and recreational benefits to the public. Improved habitat for these fishes is closely allied to objectives of the Riparian-Wetland initiative and clearly is an integral part of Ecosystem Management strategies.

Selected accomplishments for FY93 include:

- At Lake Havasu, Arizona, two access sites, including a floating fish dock, shoreline fishing stations and trails, shade ramadas and a parking areas were completed. This will allow an increase of 17,000 angler use days per year.
- Arizona completed its inventory of riparian areas and has prioritized them for revegetation and other management actions.
- 1,200 acres of riparian habitat along the Black River in New Mexico's Carlsbad Resource Area was protected by fencing. 20 volunteers helped plant cottonwood and willow cuttings along the river.
- Yuma District, Arizona, collected 1,400 Christmas trees and sank them to provide structure for fish in Squaw lake, Little Senator Wash Reservoir along the Colorado River and in Black Rock Cove, Lake Havasu.
- The Gila Box Riparian National Conservation Area plan has been drafted. This plan guides management along 38 miles of riparian canyons.
- A Coordinated Resource Management Plan for New Mexico's Black River was completed. Objectives for riparian vegetation, wildlife and fish, recreation and environmental education have been defined.
- 9 miles along Riser Creek and 6 miles of Washburn Creek in Nevada's Winnemucca District were fenced to exclude livestock and improve the aquatic habitat for Quinn River race of the Lahontan Cutthroat Trout.
- Sikes Act funding was used to develop and protect 10 acres around the Carlsbad Resource Area's Ben Slaughter Spring.
- New Mexico is pursuing acquisition of 4,000 acres on the Rio Salado Riparian Area which will greatly enhance management possibilities.
- The Las Cruces District established Riparian Demonstration Areas in 1988 to illustrate how riparian vegetation will respond to various management actions. Salt cedar removal, native tree planting and vegetation monitoring continue.
- In the Yuma District, Arizona, 70 citrus trees were sunk for fish structure in a backwater of the Imperial Division.
- Cottonwoods, willows and mesquite were planted to restore vegetation near Martinez Lake, Fisher's Landing, Betty's Kitchen Wildlife Interpretive Area and Standard Wash Cove in the Yuma District, Arizona.
- In the Farmington District, New Mexico, 13 erosion control dams were constructed in cooperation with the La Plata Coal Mine. Aquatic habitat in the La Plata River will benefit.
- 40 miles of the Gila River were monitored for resident fish in cooperation with the Bureau of Reclamation in the Phoenix Resource Area.
- Salt cedar control and revegetation with native trees continues along the Rio Grande and Rio Ojo Caliente in New Mexico.
- On Trapper Creek in Colorado, BLM, Trout Unlimited and the Grand Valley Anglers have planted over 2,500 willows, maintained and monitored instream structures and completed a channel aggradation project that raised the channel two feet.
- A riparian Ecological Site Inventory was begun through a Challenge Cost Share

agreement with the New Mexico Natural Heritage Program and 8 of an estimated 58 sites in the state were completed in FY93.

- Assessment of burrow damage to riparian areas and a search for solutions was initiated by Arizona's Lower Gila Resource Area through the formation of the Santa Maria River Cottonwood/Burro Technical Committee. Field monitoring began in May.
- Colorado BLM has made progress in the Arkansas River Water Needs Assessment, an ecosystem analysis of the river's capability to provide recreation, fisheries, municipal water supplies, irrigation water and wildlife habitat. Many agencies and private interest groups are working together.
- An inventory of fisheries and limnological values along the 36-mile Bill Williams River was completed. Water quality and macroinvertebrate sampling will guide the reintroduction of native fish populations.
- 28 miles of 11 streams on public land in the Craig District, Colorado, were sampled to provide baseline data needed for restoration of populations of the Colorado River Cutthroat Trout.
- 5th and 6th graders from three local elementary schools planted 1,200 deergrass and sacaton grasses along Empire Gulch, a tributary of the Tucson Resource Area's Cienega Creek.
- Volunteers from the Mesilla Valley Flyfishers and New Mexico State University helped with icthiofaunal and benthic surveys on the Rio Bonita and Salado Creek.
- Over 500 shrubs were planted in a 60-acre riparian exclosure near Walcott Reservoir and 500 willow cuttings were planted along Birch Creek in Idaho's Burley District. The latter was an Eagle Scout project.
- Published the *Upper Arkansas River Angling Guide* in cooperation with partners in Colorado.
- A management plan for the Colorado Cutthroat Trout was Completed for Cunningham Creek where the Five Rivers Chapter of Trout Unlimited has contributed important voluneer time and raised substantial funding.
- Watershed management plans were written to improve habitat for the Redband Trout in Squaw and Hardtrigger Creeks (Snake River tributaries) and in the North Fork of the Owyhee River and its tributaries. The adjustment of livestock grazing is expected to be the most effective management action.

SPECIAL STATUS SPECIES

Goal: Increase populations of threatened and endangered plants, fish, and wildlife on lands managed by BLM, and restore species and populations to historic ranges.

Public lands provide part or all of the habitat requirements for about 190 listed threatened and endangered plant and animal species, involving about 16 million acres of habitat. Slowing the increase in listed species and promoting currently listed species are our major goals.

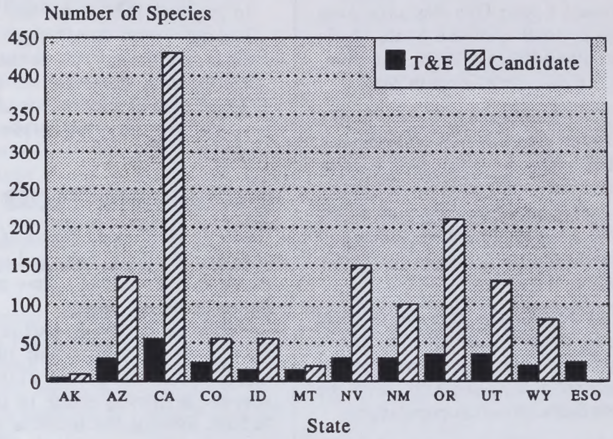
The Endangered Species Act of 1973, as amended, requires BLM to carry out programs for threatened and endangered species and their habitats so that the protective provisions of the Act are no longer necessary. This is a huge challenge. Annually, biologists, botanists and managers are routinely involved in dozens of formal and informal consultations with the Fish and Wildlife Service and National marine Fisheries Service. Further, a large amount of the available time and funds is dedicated to special status species management.

Special Status Plant Habitat

One in five native plants in the United States is at risk of extinction. More than 100 Federally-listed threatened or endangered plant species occur on BLM land, while another 700 species are candidates for listing. The BLM's national strategy plan for Management of *Rare Plants and Natural Plant Communities* provides the blueprint for conserving rare plants and plant communities on BLM lands.

Threatened, Endangered and Candidate Species by State

BLM FY93



To preserve biological diversity, the BLM must ensure the continued survival of natural plant communities. The BLM is striving to restore and maintain all plant communities on public lands so they will be able to perform their vital roles in the ecosystem, such as filtering and retaining water to ensure a clean, reliable water supply; removing carbon dioxide from the atmosphere and restoring oxygen; retaining soil and increasing fertility; and providing habitat for wildlife and forage for livestock.

The Special Status Plants program is a relative newcomer to BLM and much of the initial effort involves inventory to determine the status and distribution of rare plants and natural plant communities. This basic information is essential for setting priorities for monitoring, research and conservation actions. For most special status plants, basic life history and ecological studies are needed to determine appropriate management actions.

Examples of FY93 accomplishments include:

- For some species, inventories have located sufficient additional populations to eliminate the need for Federal listing. In Colorado, BLM surveys discovered a greater abundance of 2 candidate plants.
- In Montana, the BLM and the Montana Natural Heritage Program inventoried and monitored 52 special status plants and found that 15 species are more abundant than previously thought.
- On the north coast of California, the California Coastal Commission and local citizens cooperated with the BLM in rehabilitating dune habitat for the Federally endangered Menzies' wallflower and beach layia.
- In California, the BLM collaborated with The Nature Conservancy and the California Department of Fish and Game to fence serpentine habitat for the Federally listed San Benito evening-primrose, protecting the species from off-highway vehicles.

- In California, the BLM discovered 30 populations of listed and candidate plant species during the inventory of 12,500 acres in the San Joaquin Valley.
- In the Caliente Resource Area of California, surveys for the Federally endangered San Joaquin woollythreads, on 32,000 acres, resulted in the discovery of 3,000 acres of occupied habitat in the Carrizo Plain Natural Area and 17 new locations in the Kettleman Hills.
- The BLM inventoried 33,000 acres for special status plants in Oregon, inventoried and monitored 295,000 acres for special status plants in Utah, and inventoried 77,000 acres and monitored habitat for 12 special status plants in Wyoming.
- In Oregon, the BLM completed 3 Conservation Agreements with FWS to protect 5 candidate plants and eliminate the need for listing 2 petitioned species.
- In Idaho, the Boise District continued Area of Critical Environmental Concern designation for Aase's onion as part of the 1990 Conservation Agreement with FWS.
- In California, the BLM acquired 800 acres of annual grassland which include one-third of the world's known Monvero Residual Sand Dunes habitat. These unusual relict dunes support a population of the Federally endangered San Joaquin woollythreads and many Mojave Desert plants which are usually found 200 miles further south. With this acquisition, the BLM now manages three-fourths of the 75 acres of Monvero Dunes habitat remaining.
- Efforts continue to provide accurate technical information on rare plants to resource specialists and land managers. In Alaska, the BLM assisted in the production of the publications *"Rare Plants of the Black River"* and *"Rare Plant of the Steese National Conservation Area and White Mountain National Recreation Area."*
- In Idaho, the BLM and the Idaho Native Plant Society developed educational signs about rare plants in the Boise foothills.

Special Status Fish Habitat

The Special Status Fishes Management Strategy Plan, completed in 1992, is now in the beginning phases of implementation. Many miles of stream and associated riparian habitat have been treated to improve fish production, especially in those watersheds containing Federally-listed species and/or streams containing fish of high risk of extinction.

Funding of BLM's non-anadromous special status fishes in FY93 was primarily funded through the *Bring Back the Natives* cost share initiative and District and Area habitat management plans. Exceptions include the following accomplishments:

- BLM in Oregon completed 20 miles of stream habitat restoration for the Warner sucker, short-nosed sucker, Lost River sucker, Lahontan cutthroat, redband trout and bull trout. In addition, 122 miles of habitat supporting the short-nosed sucker and Lost River sucker were surveyed.
- The Soldier Meadows Conservation Project was developed between BLM, The Nature Conservancy, and the Soldier Meadows Ranch. The BLM purchased the Humboldt County habitat for the threatened Desert Dace and Lahontan Cutthroat Trout, and other natural and historical features of the ranch. The project will enhance and protect riparian ecosystems and should contribute to delisting of both species.
- At Lake Havasu, Arizona, two coves were prepared for the stocking of 2,000 native razorback suckers and 2,000 bonytail chub.

Bring Back The Natives

Bring Back the Natives (BBTN) is a national campaign designed to improve the status of native aquatic species on public lands through riparian area rehabilitation, watershed restoration, and species reintroduction. The program emphasizes the application of Ecosystem Management principles to public lands managed by the BLM and Forest Service in order to conserve, restore, and maintain aquatic biological diversity. It was developed in 1992 by the BLM, Forest Service, and National Fish and Wildlife Foundation (NFWF). During 1993, there were

34 BBTN projects selected with a combined federal/non-federal budget of $2,634,125.

Allocating $448,150 to BBTN projects, the BLM is implementing 22 projects in 9 Western States including Apache Creek in Colorado, the Crooked River watershed in Oregon, and Bookcliffs-Bitter Creek in Utah. Benefiting a wide variety of aquatic species and wildlife, some projects contribute towards the recovery of a targeted threatened or endangered species, while other projects are reversing the decline of candidate and/or special status species.

Examples of accomplishments in FY93 include:

- A greenhouse facility was constructed to grow riparian plants for restoration efforts in the Crooked River Watershed in Oregon. Other 1993 accomplishments in the Crooked River Watershed include; riparian planting, instream improvements, stream clean ups, fish salvage, and the construction of a handicap access/fish viewing platform.
- Approximately 4,500 aspen, alder, and chokeberry seedlings were planted to restore riparian areas along the Marys River in Nevada. Twenty-five miles of fencing was inspected and modified to protect 8,000 acres of riparian meadows.
- Ten live siltation baffles, consisting of willow and black cottonwood cuttings (1,800 in total) and several hundred riparian plants were constructed to control erosion and improve habitat conditions for salmon in the Mattole River, California.
- The first of two fish migration barriers was constructed on La Barge Creek in Wyoming. This is the first step towards the restoration of Colorado River cutthroat trout.
- Approximately five and a half miles of fencing was constructed along Bitter Creek, Utah to exclude livestock from riparian areas and improve habitat conditions for the native fish fauna.
- A prescribed burn of 1,700 acres will improve upland conditions in the Currant Creek basin in Wyoming. Seven miles of fencing was constructed to protect riparian areas. Colorado River cutthroat trout numbers have jumped from seven fish per mile in 1989 to 295 fish per mile in 1992.
- Trout Unlimited (TU), Coors Pure Water 2000, and the BLM initiated a cooperative agreement to facilitate increased participation of individual TU Chapters on specific BBTN projects. Coors awarded TU a $10,000 grant to restore the Marys River watershed in northeast Nevada and has earmarked $2,500 for Atlantic salmon restoration.

Special Status Animal Habitat

The BLM wildlife program has been heavily involved in the management of habitat of threatened, endangered and special status wildlife.

Examples of Special Status Animal Accomplishments in FY93 include:

- Cooperating with the New Mexico Department of Game and Fish, the BLM completed the third year of research to protect and enhance the habitats of the river cooter turtle and the blotch plain-bellied water snake.
- Amphibian and reptile inventories along all 21 creeks on public lands within the Hollister Resource Area, California. These populations comprise a significant portion of the species' total populations in the inner south coast ranges in the state.
- The BLM Arizona, in conjunction with riparian monitoring, surveyed 2,000 acres for Mexican garter snakes and lowland leopard frogs. Other research included monitoring techniques, distribution, habitat requirements, and population biology of the flat-tailed horned lizard.
- The BLM's Las Vegas District, in a cooperative effort with NPS, the Bureau of Reclamation, and the University of Nevada Las Vegas, inventoried 5 miles of stream for the candidate relict leopard frog and the believed to be extinct Vegas Valley leopard frog.

- The Medford District, Oregon, completed inventories of the Western Pond Turtle, a species proposed for listing as threatened or endangered.
- A herpetology guide was completed by the Coos Bay District in Oregon.
- In developing the area's natural gas resources, the BLM Eastern States Mississippi Jackson District is cooperating with FWS, and Fort Chaffee in Arkansas to monitor and protect a newly discovered population of the endangered American burying beetle.
- In Oregon, the BLM, in cooperation with the Oregon Natural Heritage Program, completed inventories of the Mary's Peak blind beetle.
- In Idaho, the BLM Burley District surveyed 2,000 acres for the presence of the Idaho dune tiger beetle.
- The Jackson District, Mississippi, is cooperating with the U.S. Fish and Wildlife Service and Fort Chaffee in Arkansas to monitor and protect a newly-discovered population of the endangered American Burying Beetle while developing the area's natural gas resources.
- Entrance and directional signs were placed at strategic points within the Armargosa Canyon and Grimshaw Lake Areas of Environmental Concern in California to help protect habitat for the rare Armargosa vole.

Desert Tortoise

The BLM has made considerable progress in implementing its rangewide plan for managing desert tortoise habitat. The desert tortoise is listed as threatened in the Mojave Desert portion of its range in the four-State area of Arizona, California, Nevada, and Utah.

The BLM has significantly improved communication and coordination between the various agencies involved with tortoise management by establishing a Management Oversight Group (MOG). The MOG includes BLM State Directors, and State Fish and Wildlife Agency Directors from the four States, the Regional Directors from 3 FWS regions, and a representative from the BLM's Washington Office, Division of Wildlife and Fisheries.

The BLM is a member of the FWS's Recovery Team which has developed a draft recovery plan for the tortoise. This recovery plan has been circulated for comments. BLM management activities and the MOG had a major influence on contents of the plan. The final recovery plan is expected in early 1994.

Management and supervision of the Desert Tortoise Conservation Center (DTCC) by the BLM Nevada Las Vegas District continued as a cooperative venture with the Nevada Department of Wildlife and The Nature Conservancy. Other cooperators involved in ongoing research projects include Drexel University, the San Diego Zoo, University of Florida, and the Smithsonian Institution. More than one third of the research papers presented at the annual Desert Tortoise Council Symposium resulted from the intense research conducted at the DTCC. BLM wildlife biologists also conducted 54 standardized tortoise transects on 9 desert tortoise permanent study plots to identify potential problems with tortoise populations.

The BLM was also a major cosponsor of an International Symposium on management of turtles and tortoises. Several technical papers and a policy statement was presented by the BLM. Since the symposium, BLM tortoise biologists have been involved in assisting other countries with tortoise management problems.

Black-footed Ferret

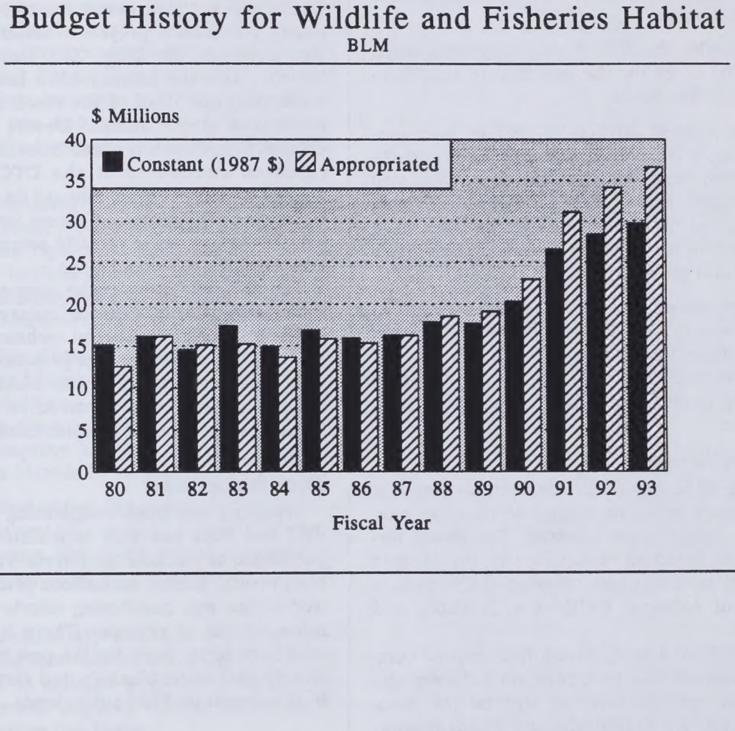
Wyoming has been cooperating with the FWS and State and Fish to maintain a wild population of black-footed ferrets. There have been several habitat evaluations prior to reintroductions and monitoring efforts to determine success of releases. There have been wild born ferret liters for the past two years. Nearly 200 adult black-footed ferrets have been released on BLM public lands.

BUDGET AND STAFFING

BUDGET

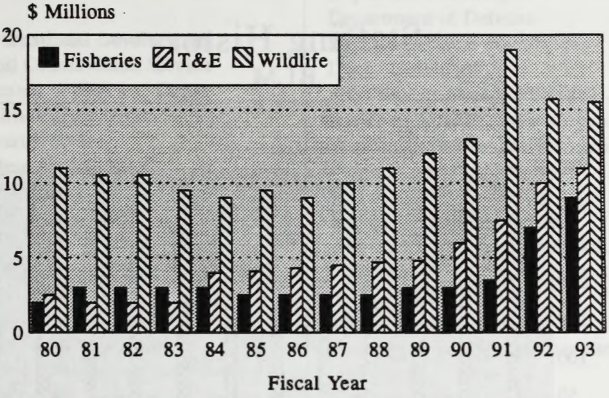
As a result of widespread acceptance of *Fish and Wildlife 2000* and its accomplishments on the ground, budget levels for the BLM's wildlife program have increased over the last several years. At the present funding levels, the projected management work needed will required two decades for completion. During that time, many of the listed species may be in greater decline, while additional species will be classified as threatened or endangered. Once a species is placed on the list, the cost of recovery to society is exorbitant. Protecting and managing these species before they are listed is much more cost effective and in the National interest. To achieve this, the BLM must be adequately funded and staffed to implement the strategy plans ensuring compliance and protection of listed species.

The graphs below delineate the budget situation for the Division of Wildlife and Fisheries through FY93. Cost estimates have been prepared for completion of the various State and National strategy plans.



Budget History by Program Component

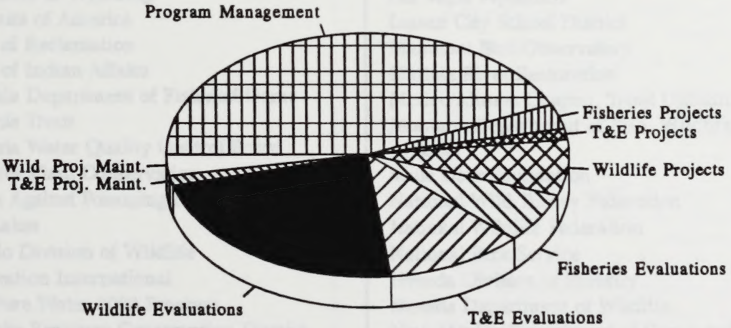
BLM



Unadjusted appropriated funds.

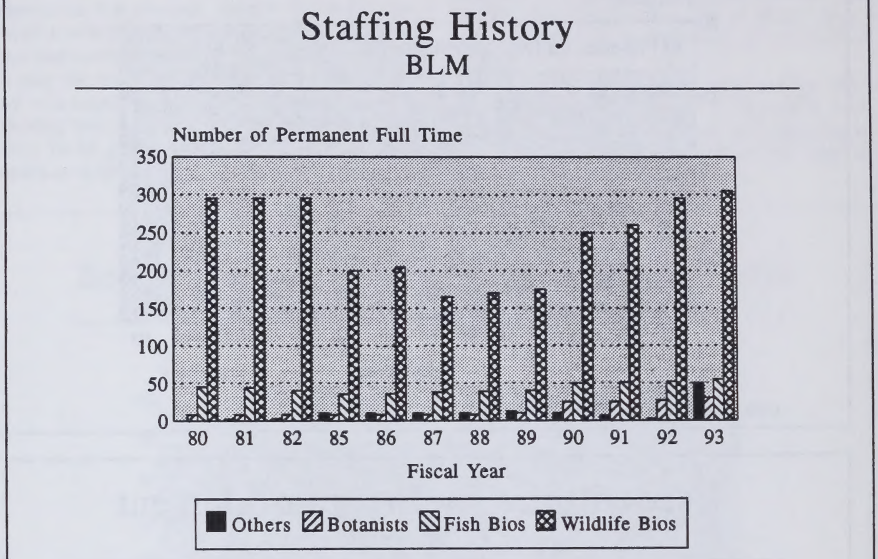
Expenditures by Program Element

BLM FY93



STAFFING

Staffing has also increased over the last several years. However, increases have lagged behind budget, in part due to hesitancy to add wildlife positions during a period of general downsizing in other programs.



APPENDIX I.

Agencies and organizations with which BLM has partnership agreements and/or operations for conservation on public lands.

45 North, Inc.
Agency for International Development
Agricultural Soil Conservation Service
Alaska Department of Fish and Game
American Ornithologists' Union
American Fisheries Society
American Birding Association
American Forest Resource Alliance
American Forest Council
American Forests (Global RELEAF)
American Fisheries Society
Amerifish Corporation
Anglers United
Animal Damage Control
Animal and Plant Health Inspection Service
Aqua Bonita Flycasters
Arizona Boys Ranch
Arizona Game and Fish Department
Barrick-Goldstrike Mine
Bass Anglers Sportsman Society
Bat Conservation International
Berkeley Inc.
Bighorns Unlimited of Elko
Bighorns Unlimited
Bitterroot Chapter, Trout Unlimited
Bowhunters of Wyoming
Boy Scouts of America
Bureau of Reclamation
Bureau of Indian Affairs
California Department of Fish and Game
California Trout
California Water Quality Control Board
Center for Plant Conservation
Citizens Against Poisoning the Environment
Clean Lakes
Colorado Division of Wildlife
Conservation International
Coors Pure Water 2000 Program
Coos Lake Resource Conservation District
Cornell Laboratory of Ornithology
Council Mothers For Clean Water
Crook County (Oregon) Middle School
Crook County School District
Defenders of Wildlife
Department of Air Force
Department of the Navy
Department of Army
Department of Defense
Deschutes Llama Foundation
Ducks Unlimited
Elko Bighorn Sheep Unlimited
Environmental Protection Agency
Environmental Protection Agency
Federation of Fly Fishermen
Fish and Wildlife Service
Fish American Foundation
Five Rivers Chapter, Trout Unlimited
Flaming Gorge Chapter, Trout Unlimited
Forest Service
Fort Sage School District
Foundation For North American Wild Sheep
Girl Scouts of America
Gunnison Gorge Anglers
Gunnison Angling Society
Hawk Mountain Sanctuary
Idaho Department of Fish and Game
Idaho Soil Conservation Commission
International Association of Fish and Wildlife Agencies
Izaak Walton League of America
Joe Rupp Trust Fund
Kern River Flyfishermen
Las Vegas Flycasters
Lassen City School District
Manomet Bird Observatory
Mattole River Restoration
Modoc/Alturas Chapter, Trout Unlimited
Montana Department of Fish, Wildlife, and Parks
Mule Deer Foundation
National Wild Turkey Federation
National Wildlife Federation
National Park Service
Nevada Division of Forestry
Nevada Department of Wildlife
New Mexico Department of Game and Fish
North Carolina Heritage Program
North Carolina Wildlife Resources Commission

North Carolina Plant Conservation Program
North Idaho Flycasters
Northeast Nevada Chapter, Trout Unlimited
Oak Brook Chapter, Trout Unlimited
Ochoco Chapter, Trout Unlimited
Old Pueblo Chapter, Trout Unlimited
Sam Point Chapter, Trout Unlimited
One Shot Antelope Society
One Shot Antelope Foundation
Oregon Department of Fish and Wildlife
Oregon Governor's Watershed Enhancement Board
Pheasants Forever
Phillips Petroleum
Quail Unlimited
Rocky Mountain Elk Foundation
Rocky Mountain Elk Foundation
Ruffed Grouse Society
Safari Club International
San Luis Valley Chapter, Trout Unlimited
Shimano American Corporation
Soil Conservation Service
South Coast Chapter, Trout Unlimited
Sweetwater Wildlife Association (Wyoming)
Tennessee Valley Authority
The California Council
The Wyoming Council
The Georgia Council
The Wildlife Society
The Wilderness Society
The In-Fisherman
The Izaak Walton League of America
The Wildlife Society
The Nature Conservancy
The Nature Conservancy
Times/Mirror Magazines Conservation Council
Trout Unlimited
Uinta Chapter, Trout Unlimited
University of California Cooperative Extension
University of California at Berkeley
USDA Soil Conservation Service
USDA Forest Service
USDA Extension Service
USDI Sequoia-Kings Canyon National Park
USDI Bureau of Land Management
USDI Fish and Wildlife Service
USDI Bureau of Indian Affairs
Utah Division of Wildlife Resources
Wildlife Conservation Board of California
Wildlife Management Institute
Wildlife Conservation International
World Wildlife Fund
Wyoming Game and Fish Department

Partnership coalitions:

Central Valley Habitat Joint Venture
Federal Neotropical Migratory Bird Conservation Committee
Intermountain West Joint Venture
National Environmental Education Council
Pacific Coast Habitat Joint Venture
Partners In Flight
Prairie Pothole Habitat Joint Venture
U.S. Forest Service/BLM PACFISH Strategy Team
Western Governors Association, Great Plains Initiative